

**Abstract**

A method and apparatus for treating wastewater streams by adding, either separately or as a mixture, a nitrate containing compound and an alkaline material in an amount sufficient to achieve a lower concentration of atmospheric hydrogen sulfide and dissolved sulfides downstream of the addition as compared to the atmospheric hydrogen sulfide and dissolved sulfides present in the wastewater stream prior to the addition. By adding alkaline material in addition to a nitrate containing compounds, the amount of nitrate containing compound added can be reduced by at least 10% as compared to the amount of nitrate that would theoretically need to be added in the absence of alkaline material to achieve a comparable lower concentration of atmospheric hydrogen sulfide and dissolved sulfides in the wastewater stream.